National Institute of Standards & Technology

# Certificate of Analysis

## Standard Reference Material® 982

### Equal-Atom Lead Isotopic Standard

This Standard Reference Material (SRM) is intended for use as an isotopic standard. SRM 982 consists of 1 g of a wire that was prepared by mixing commercial and radiogenic leads to obtain essentially equal-atom amounts of Lead-206 and Lead-208. It is chemically pure to at least 99.9 + % purity. The atomic weight of the material is calculated to be 206.9429 using the nuclidic masses 203.973044, 205.974468, 206.975903, and 207.976650. The certified isotopic compositions are given below.

| | | | |
|---|---|---|---|
| Atomic Abundance Ratio, Lead-204/Lead-206 | 0.027219 | ± | 0.000027 |
| Atomic Abundance Ratio, Lead-207/Lead-206 | 0.46707 | ± | 0.00020 |
| Atomic Abundance Ratio, Lead-208/Lead-206 | 1.00016 | ± | 0.00036 |
| Lead-204, atom percent | 1.0912 | ± | 0.0012 |
| Lead-206, atom percent | 40.0890 | ± | 0.0072 |
| Lead-207, atom percent | 18.7244 | ± | 0.0023 |
| Lead-208, atom percent | 40.0954 | ± | 0.0077 |

Overall limits of error are based on 95 % confidence limits for the mean of the ratio measurements and on allowances for the known sources of possible systematic error.

**NOTICE TO USER:** SRM 982 contains radioactive Lead-210 of natural origin. The massic activity, as of December 2004, was 3 kBq of Lead-210 per gram of SRM 982. Purchase and users must comply with all state and federal regulations regarding the use and disposal of this material. Contact your State Office of Radiation Safety for more information.

Measurements for certification were by triple filament solid-sample mass spectrometry. Mixtures with known $^{208}Pb/^{206}PB$ ratio, prepared from high-purtiy separated isotope solutions, were used as comparision standards. Details of the preparation and measurements are described in reference 1.

The analytical measurements leading to the certification of this material were performed in the NIST Inorganic Analytical Research Division.

The support aspects involved in the preparation, certification, and issuance of this SRM were coordinated through the Standard Reference Materials Program by C.S. Davis of the NIST Measurement Services Division.

Willie E. May, Chief
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Certificate Issue Date: 15 December 2004
*See Certificate Revision History on Last Page*

Robert L. Watters, Jr., Chief
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## REFERENCE

[1] Catanzaro, E.J.; Murphy, T.J.; Shields, W.R.; Garner, E.L.; *Absolute Isotopic Abundance Ratios of Common, Equal-Atom, and Radiogenic Lead Isotopic Standards*; J. Res. Natl. Bur. Stand., Vol. 72A, No. 3, p. 261–267 (1968).

**Certificate Revision History:** 15 December 2004 (This revision reports editoral changes); 25 March 1991 (Editoral changes); 01 June 1968 (Original certificate date).

*Users of this SRM should ensure that the certificate in their possession is current. This can be accomplished by contacting the SRM Program at: telephone (301) 975-6776; fax (301) 926-4751; e-mail srminfo@nist.gov; or via the Internet http://www.nist.gov/srm.*